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A SERVICE FOR INDUSTRY BUSINESS ENGINEERING AND RESEARCH
ROBERT M. SHERMAN, EDITOR. PUBLISHED BI-WEEKLY BY ATOMIC ENERGY NEWS CO., 1000 SIXTH AVENUE, NEW YORK 18, N. Y.

Dear Sir:

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Substantial losses in market value of uranium mining concerns held are indicated by the recently issued quarterly report of Atomic Development Mutual Fund, Inc., Washington. Declines in Beaver Lodge Oil Corp. (89,200 shares held), Preston East Dome Mines (110,000 shares held), and other portfolio securities were shown. The Fund's largest holding, Babcock & Wilcox Co. (17,700 shares held) is not now making money in its atomic division, and probably will not make money for several years. (Alfred Iddles, president of B & W, apprised his shareholders of this fact in New York recently; this LETTER, 4/17/56, p. 3.) Net asset value of the Fund on March 31, 1956 was $45,728,470 as compared with $34,581,581 on Mar. 31, 1955. Stockholders were not advised whether this was due to portfolio appreciation, through atomic activities of companies held, or to new share purchases by the public. (Other FINANCIAL NEWS, p. 3 this LETTER.)

A revised 5-year USAEC contract for operation of the Hanford, Washington, plutonium production plant has been awarded General Electric Co. following negotiations between G-E and the USAEC. General Electric will now receive a fee of $2,650,000 a year for managing the project which it had handled for a $1 a year fee, since 1946, on a cost-plus basis. Under the new contract, G-E will absorb in its fee certain indirect and overhead expenses for which it previously had been reimbursed. These expenses include a share of home office costs, the costs of G-E's atomic products division at Schenectady, and certain bonus payments. G-E will also assume certain liabilities which were carried by the Government under the original contract. The new contract provides for G-E to be reimbursed for all costs of operating the Hanford plutonium plant; the community of Richland, Wash., which exists solely for this plant; and Knolls Atomic Power Laboratory, near Schenectady, N.Y. (Other BUSINESS news, p. 2 this LETTER.)

A site at Winfrith Heath, Dorset, is being considered by the U. K. Atomic Energy Authority for an extension of the type of research activity which is being carried on at its Atomic Energy Research Establishment, Harwell. Consideration of the new site is a reflection of the increase in nuclear research work in England made possible by larger Government appropriations for both weapons and commercial applications of nuclear energy. (Other RESEARCH news, p. 3 this LETTER.)

A new rare earth mineral containing uranium, discovered in the Mary Kathleen uranium lease in the Mt. Isa district of Queensland, Australia, has been named stillwellite in honor of the work of F. L. Stillwell, of the Commonwealth Scientific and Industrial Organization, Melbourne. This is the second case of a new uraniferous mineral being discovered in Australia; the first one, named davidite, was discovered some years back in Radium Hill in South Australia.

The use of its patents in radioactivity oil well logging is now being permitted under license, according to Well Surveys, Inc., Tulsa, Okla., who hold some 68 patents in this field. (Other ATOMIC PATENT news, p. 5 this LETTER.)

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ATOMIC ENERGY BUSINESS NEWS...

ZIRCONIUM CONTRACTS AWARDED:- Three contracts were awarded last fortnight by the USAEC for its purchase during each of the next five years of 2.2. milion pounds of zirconium at an average annual cost of $14 million. Receiving a contract to supply the USAEC with one million lbs. per year of zirconium, at about $5.00/lb., was National Distillers Products Corp., which will build a 1½-million lb. per year capacity plant at Ashtabula, Ohio. A new sodium reduction process will be used. Another contract was given NRC Metals Corp., under which it will supply the USAEC with 700,000 lbs. per year of zirconium, at $6.50 per lb. NRC Metals will build a new plant near Pensacola, Fla., using an ammonia and nitric acid refining process developed by National Research Corp., of which NRC Metals is a subsidiary. Raw materials for NRC Metals will come from Escambia Bay Chemical Corp., another subsidiary of National Research Corp. The third contract was given to Carborundum Metals Co., which is presently supplying the USAEC with 200,000 lbs. per year of the metal. Under its new contract Carborundum will furnish the USAEC with an additional 500,000 lbs. per year at about $7.50 per lb. The plant will use the higher cost Kroll process involving magnesium reduction.

In addition, Carborundum's old delivery contract was increased from 200,000 lbs. per year to 350,000 lbs. per year; the USAEC will import 200,000 lbs. of the metal from Japan; and the USAEC will buy 300,000 lbs. per year from Wah Chang Corp., New York, which will reactivate the now-shut-down Bureau of Mines zirconium pilot plant at Albany, Ore.

Purchase of the metal is the result of increased Navy demands, following satisfactory operational performance tests of nuclear reactors (using zirconium as structural material for cores) in the Navy's ship and submarine propulsion program.

FIRST CONSTRUCTION PERMITS FOR NUCLEAR POWER PLANTS ISSUED:- Consolidated Edison Co. of N.Y., and Commonwealth Edison Co., Chicago, have received USAEC permits for construction of their nuclear power plants, both of which are in an advanced engineering stage. Consolidated will put up a $55 million plant at Indian Point, N.Y., with 236,000 KW of electrical capacity, using 5,699 kilos of uranium-235. The Commonwealth plant will generate 180,000 KW of electrical energy, and will be in Grundy County, Ill.; it will require 8,323 kilos of uranium-235. When the companies submit a hazards report summary to the USAEC, their construction permits will be changed to 40-year licenses.

CONTRACTOR SELECTED FOR LIQUID METAL-FUELED REACTOR EXPERIMENT:- Babcock & Wilcox has been selected by the USAEC (from 11 companies submitting proposals) to build and operate a liquid metal-fueled reactor experiment (LMFRE), at a site yet to be selected. B&W will use Union Carbide Nuclear Co. as its major subcontractor, primarily for chemical processing of fuel. The LMFR, under study at Brookhaven National Laboratory for some years, may simplify fuel processing. Brookhaven also feels that its other advantages: flexibility of operation over a wide power output range, and steam conditions comparable to those in modern conventional generating plants, make the LMFR a promising type.

INSURANCE FOR RADIATION HAZARDS TO BE OFFERED:- A syndicate has been formed to underwrite the public liability radiation hazards of commercial nuclear reactors, and related operations, by some 110 capital stock casualty insurance companies. The group, known as the Nuclear Energy Liability Insurance Assoc., will offer up to $50 million in "third party liability" insurance coverage for each nuclear reactor; this is about four times more than ever before available in the U.S. to a manufacturing operation. Governing committee of the association is composed of: Aetna Casualty & Surety Co.; Fidelity & Casualty Co. of N.Y.; Hartford Accident & Indemnity Co.; Indemnity Insurance Co. of North America; Maryland Casualty Co.; Royal-Liverpool Insurance Gp.; St. Paul Mercury Indemnity Co.; Travelers Group; and United States Fidelity & Guaranty Co.

CONSTRUCTION BIDS ASKED--CONTRACTS AWARDED:- Plans and specifications are available from the USAEC, Idaho Falls, Idaho, for initial construction work on the organic moderated reactor site at the reactor testing station there. Contract is No. AT(10-1)-817.

Ralph M. Parsons Co., Los Angeles, has received a contract for designing and supervising a test building, shielded control and equipment building, and supporting facilities to cost some $12 million at the aircraft nuclear propulsion area of the national reactor testing station, Idaho Falls, Idaho. Parsons had done architect-engineering of other facilities at the ANP site there.

ATOMIC ENERGY FINANCIAL NEWS...

URANIUM MILLING FACILITIES FINANCED:- Private financing has been arranged by Atomic Resources Corp. (New York) for construction of a mill to process uranium-vanadium ores from company properties in the Dry Valley area, San Juan County, Utah. The money was put up by a group of New York investors through Empire Resources Corp. In addition, Molybdenum Corp. of America has purchased a stock interest in Atomic Resources..... A joint proposal by Climax Molybdenum and Mallinckrodt Chemical will be submitted to the USAEC to construct and operate a privately owned plant for refining uranium compounds.

NEW FINANCING FOR URANIUM MINING CONCERNS:- American Metal Co., Ltd., New York, announced last fortnight that it will invest $4,500,000 in a uranium venture with Sabre Uranium Corp. and Pinon Uranium Co. Sabre is to acquire Pinon in exchange for Sabre common stock, with American Metal investing $2 million for 25% of the resulting common stock, and $2.5 million for preferred stock. American Metal will also manage the development of Sabre's uranium properties in McKinley County, N.M., and the erection of milling facilities. The agreement must be approved by stockholders of Sabre and Pinon, and is contingent upon satisfactory market contracts being made with the USAEC.

ADDITIONAL WORKING CAPITAL SECURED BY FIRM IN NUCLEAR FIELD:- Technical Operations, Inc., Arlington, Mass., whose principal commercial endeavor is its industrial gamma radiographic equipment, recently secured $553,000 in additional working capital through sale of 42,119 shares of its common stock to Western Union Telegraph Co., and American Broadcasting-Paramount Theatres, Inc., the firm reports. F. C. Henriques, Technical Operations president, said that government research and development contracts continue to be a main source of the firm's revenue. He hoped, however, that the firm's agreement with Picker X-ray Corp., to sell and service Technical Operation's gamma radiographic equipment, would result in an increase in the sale of this equipment.

CONSOLIDATION PLANNED FOR MERGED FIRMS: Following last fortnight's stockholders' approval, the merger of Baird Associates, Inc., and Atomic Instrument Co., both of Cambridge, Mass., has resulted in a new firm known as Baird Associates-Atomic Instrument Co. Baird manufactures optical-electronic equipment, while Atomic makes instruments and components for the electronic and nuclear field. Plans are to consolidate both organizations under one roof as soon as possible, according to Walter S. Baird, president of the merged firms.

RESEARCH & ACADEMIC NEWS...in nuclear fields...

NEW RESEARCH REACTOR:- Plans for a nuclear research reactor to be erected at Massachusetts Institute of Technology, Cambridge, have been approved by the USAEC. The heavy-water cooled and moderated reactor, enclosed in a gas-tight, steel-shell building, will be used in medical therapy and in research and development. Operation will be at power levels up to 1000 KW, using enriched uranium as fuel. ACF Industries, New York, will construct the reactor for MIT.

TRAINING PLANS:- A National Institute for Atomic Science and Technology has recently been set up at the Saclay Atomic Research Station, France, for training engineers and technicians. The Institute will provide the necessary links between industry and the universities in order to develop industrial applications of atomic energy.

NEW BOOKS & OTHER PUBLICATIONS...

Radiation Chemistry for Industry. W. D. Conklin, A.T. Dickson et al. Thorough coverage in a practical manner. 78 pages. --T. Lang Moffat, 70 Clearview Heights, Toronto 9, Canada. ($7.50)

State Regulation of Atomic Energy, E. B. Stason, W. J. Pierce, S. D. Estep. Part of a planned volume on Atomic Energy & the Law. --Univ. of Mich., Legislative Res. Center, Ann Arbor, Mich. (n/c)

Chimie Physique Nucleaire. Jacques Errera. Covers applied radioactivity, nuclear reactors, radioisotopes, etc. 226 pages. --G. Thone, 11 rue de la Commune, Liege, Belgium (300 Belgian Frs.)

U.S. Army Panel Discussion on Radiation Preservation of Food. Proceedings of the discussion at the Dep't. of Commerce's atomic energy exhibit, Wash., D.C., Apr. 17, 1956. 22 pages. --Office of Tech. Services, Wash. 25, D.C. (75¢)

POSSIBILITIES FOR DEVELOPING ECONOMIC SMALL POWER REACTORS: Condensation of remarks by Louis H. Roddis, Deputy Dir., Div. of Reactor Dev., USAEC, at American Public Power Assoc. Convention, Los Angeles, Cal., Apr. 26, 1956.

There are two atomic power topics related to costs which I will discuss: (1) The ceilings below which atomic power costs must be brought to be of interest to atomic power plant builders and operators, and (2) the different types of power reactors that today are receiving the attention of reactor development people, utility people, and equipment manufacturers, with emphasis on those of promise for small plants.

Let us look at the first cost of nuclear power plants alone, that is, the construction cost both as given in proposals for plants and as data for plants actually under construction. The range is from $220 to $960 per KW. The first figure is for the proposed plant of Consolidated Edison Co., at Indian Point, N.Y., which will get a considerable part of its power from an oil superheater. The second figure is for a military plant, the quite small Army package power reactor being built at Ft. Belvoir, Va.

Now let us set up a total cost (dollars per KW of indicated capacity) for three classes of conventional power plants: large steam plants, small steam plants, and small diesel plants. Our people have worked up these figures: for large steam plants (averaging 224,000 KW capacity in four turbo generator units) $700 per KW of capacity; for small steam plants (averaging 36,000 KW in four units) $1,200 per KW; and for diesel plants (averaging 4,500 KW in four units) $1,700 per KW.

With this comparison, it encourages me to find that the first cost of nuclear plants, by and large, appears to be getting down under the total costs for conventional plants. In this respect, the data are particularly encouraging for the small plant range.

However, two important factors should be borne in mind. One is that the nuclear costs quoted are for plants that have not been built, since there has not yet been completed in the U.S. the first commercial type nuclear power plant. These figures, therefore, are merely estimates. The other point is that multiple production of small nuclear plants is likely to lead to lower first costs. (Of course, first costs of nuclear plants, while merely estimates, are susceptible to some degree of validity. But operating costs of nuclear plants, which depend on fuel element life, are less dependable and are quite speculative. This is why I have not, and will not, make operating cost estimates of nuclear plants at this time.)

In taking up the second topic, concerning the different types of reactors, it should be noted that there are three types which appear suitable only for very large powerplants. These are the fast breeder reactor; the natural uranium, graphite-moderated, water-cooled reactor; and the natural uranium, graphite-moderated, gas-cooled reactor. (The British and French are using the natural uranium, graphite-moderated, gas-cooled reactor for their first power reactors because this type requires no enriched uranium, produces plutonium, and presents negligible corrosion problems.)

At present, the pressurized water type is the only reactor that has been demonstrated in a full-scale, practical and useful powerplant. I refer, of course, to the plant in the submarine Nautilus, and its land prototype in Idaho. But while research and development for this submarine powerplant built up pressurized water technology tremendously, this particular plant itself contributes little directly to economic civilian power. Furthermore, it is fueled entirely with fully-enriched uranium (about 90% is expensive uranium-235) to make it small enough to fit into a submarine.

Yet I would not minimize the prospects for pressurized water reactors. It is interesting to note that both the high and low cost figures ($220 and $960 per KW), for first cost of nuclear power plants, are for pressurized water plants. Meanwhile, five other pressurized water reactors are being built or projected in the U.S.:- (1) The first army package power reactor being built for the Government at Ft. Belvoir, Va., by Alco Products, Inc.; (2) The 134,000 KW plant that Yankee Atomic Electric Co. desires to build in Rowe, Mass.; (3) The 250,000 KW plant Consolidated Edison Co. of New York is building at Indian Point, N.Y. (4) A combination power and research reactor with a capacity of 2,000 KW the Univ. of Florida has proposed to build, and (5) The power reactor that the Belgian firm SEEN has ordered from Westinghouse Elec. Corp. for installation and operation in Belgium.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear lab & plant...

FROM THE MANUFACTURERS:- Model DS-1A probe-type scintillation detector uses what the manufacturer states is an exclusive preamplifier circuit which is said to permit its use with quarter-volt scalers and ratemeters or gamma-ray spectrometer systems. The instrument, designed for medical, biological, industrial and physical research where gamma-emitting radioisotopes are used, contains a 3/4" x 3/4" gamma sensitive sodium iodide crystal, type 6292 photomultiplier tube, preamplifier circuitry, magnetic shielding, and a detachable nose piece collimator. --Nuclear Instrument & Chemical Corp., Chicago, Ill.

Model 414 logarithmic radiation survey meter is usable for direct readings of x-ray, gamma and beta radiations over a full scale ranging from 3.0 to 3,000 mr/hr. The patented one tube circuit used is said to provide accuracy of plus-or-minus 20% throughout the entire range. This simplified circuit is also said to increase battery life resulting in 1000 hour life for filament batteries, approximately 3,000 hours for "B" battery life, and shelf life for chamber batteries. --Atomic Instrument Co., Cambridge 39, Mass.

Trade-named Fixt-Flo Air Sampler, a newly-designed instrument is said to enable the precise measurement of airborne contaminants taken from large samples of air. A feature of this new instrument is an automatic flow control which compensates for changes of filter resistance caused by collected material. --Mine Safety Appliances Co., Pittsburgh, Pa.

NOTES:- Bendix Aviation Corp.'s Cincinnati division is now in production on a U. S. Government order for 85,000 high level radiation dosimeters for ultimate use by the Office of Civil Defense and U. S. Army's Signal Corps. Already delivered by Bendix is an order for 20,000 of these pocket type dosimeters. The Bendix unit meets such Signal Corps specifications as being operable through a minus 50 deg. F. to plus 160 deg. F. temperature range, and unaffected by severe changes in barometric pressures.

Success in radiation sterilizing foodstuffs, so that they may be preserved and their shelf life lengthened, was recently described by Bernard E. Proctor, head of the department of food technology, Massachusetts Institute of Technology, at a conference in New York of food and drug officials. Dr. Proctor said experiments by his group at M.I.T. had indicated that the foods most promising for preservation by irradiation are meat, poultry, bacon, fresh pork sausage, liver, fish and shellfish, green beans, spinach, asparagus, and cereals. He predicted that milk and milk products, previously thought unsuitable for preservation by irradiation, may be added to the list as a result of recent research using gamma rays.

ATOMIC PATENT DIGEST...grants & other news in the atomic energy field...

PATENTED INVENTIONS AVAILABLE FOR LICENSE:- Licenses for radioactivity well logging under some 68 patents owned by this firm are being offered by Well Surveys, Inc., P.O. Box 2656, Tulsa, Oklahoma. Further information may be obtained from the firm's patent attorney.

NEW U.S. PATENT GRANTS OF INDUSTRIAL INTEREST:- Mechanism for electric arc welding. U.S. Pat. No. 2,743,342 issued Apr. 24, 1956; assigned to United States of America (USAEC).

Improvement in electrolytic cell. U.S. Pat. No. 2,743,228 issued Apr. 24, 1956; assigned to United States of America (USAEC)

Apparatus for bombarding samples with fast neutrons. U. S. Pat. No. 2,743,226 issued Apr. 24, 1956; assigned to United States of America (USAEC).

Submerged nuclear reactor. U.S. Pat. No. 2,743,224 issued Apr. 24, 1956; assigned to United States of America (USAEC).

Low weight container for radioactive materials. U.S. Pat. No. 2,743,372 issued Apr. 24, 1956; assigned to United States of America (USAEC).

Solvent extraction equipment. U. S. Pat. No. 2,743,170 issued Apr. 24, 1956; assigned to United States of America (USAEC).

Method of recovering dissolved uranium compounds from acid leach liquors. U.S. Pat. No. 2,743,154 issued Apr. 24, 1956; assigned to United States of America (USAEC).

Sincerely,

The Staff,
ATOMIC ENERGY NEWSLETTER.

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